



**UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/465,131 12/16/99 RAJAGOPALAN

S 65611

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EXAMINER

GUADALUPE, Y

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 02/13/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/465,131

Applicant(s)

RAJAGOPALAN ET AL.

Examiner

Yaritza Guadalupe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention :

I. Claims 1 – 7, drawn to an apparatus, classified in class 374, subclass 179.

II. Claims 8 - 11, drawn to a method, classified in class 29, subclass 592.

2. Inventions II and I are related as method and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the method as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different method. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different method such as a method which does not requires the removal of conductive bumps from the semiconductor die.

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3. During a telephone conversation with Mr. Ralph Veseli on December 11, 2001 a provisional election was made with traverse to prosecute the invention of Group I, claims 1 – 7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8 - 11 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

5. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(1). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

6. The claims are objected to because the lines are crowded too closely together, making reading and entry of amendments difficult. Substitute claims with lines one and one-half or double spaced on good quality paper are required. See 37 CFR 1.52(b).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claims 1 and 4 - 6 are rejected under 35 U.S.C. 102 (e) as being anticipated by Hembree et al. (US 6,121,576).

Hembree et al. discloses an apparatus comprising a packaging substrate (18) having a first surface (48) and a second opposite surface (52), the first surface having at least one bonding pad (24), a semiconductor die (10) positioned on the packaging substrate and secured to the bonding pad (24), an opening and a thermocouple (50) inserted in / on the substrate (See Column 5, lines 26 – 30). Hembree et al. discloses the semiconductor die including an active circuit surface having conductive bumps (See Column 3, lines 61 – 64) and the substrate including a plurality of bonding pads (26) formed on the surface (See Column 4, lines 6 – 7) and where the semiconductor die is positioned on the substrate such that the conductive bumps are in electrical contact with the bonding pads. Hembree et al. discloses the substrate and semiconductor die secured in place by a solder bond between the bumps and the bonding pads, securing the thermocouple in position (See Figure 3).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 - 3 and 7 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Hembree et al. (US 6,121,576) in view of Hayes (US 5,681,757).

Hembree et al. discloses an apparatus as stated in paragraph 8 above.

Hembree et al. does not disclose the use of adhesive, comprising epoxy, for securing the thermocouple as stated in claims 2 and 3. Hembree et al. does not discloses the opening passing through the first surface and the bonding pad as stated in claim 7.

Regarding claims 2 and 3 : Hayes discloses a process where an adhesive (44), epoxy (See Column 8, lines 30 – 34), is used on the surface of a substrate (48) for attaching a die (30). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use an adhesive as taught by Hayes in the apparatus disclosed by Hembree et al. in order to provide a mechanical protection for the thermocouple and provide an electrical conductor as well as a bonding mechanism.

With respect to claim 7 : Hembree et al. and Hayes discloses an apparatus having a thermocouple (50) inserted in / on, which suggest the option of an opening, in the substrate (18). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use an opening through the substrate for inserting the thermocouple and the bonding pad since Hembree et al. and Hayes are teaching an alternate way to position~~ed~~ the thermocouple and no reason has been given by Hembree et al. and Hayes for not doing so, and in order to provide a mechanism to obtain the real temperature of the semiconductor die.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gisdakis et al. (US 5,052,821) discloses an instrument comprising a semiconductor (1), and a thermocouple (5). Renken (US 5,746,513) discloses a substrate (10) comprising an opening (13) for inserting a thermocouple junction (15). Doke (US 5,367,890) discloses an apparatus comprising a substrate (32) including semiconductor dies (14, 16, 18, 20), thermocouples mounted on the substrate (See Column 5, lines 48 – 52). Schrock et al. (US 6,110,805) discloses an apparatus comprising a substrate (22), a semiconductor die (24), a resin based adhesive for securing the die (See Column 3, line 59). Hedengren et al. (US 5,909,004) discloses an array comprising a substrate (50), a semiconductive die (10), an

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adhesive (54), an opening (14). Siegel et al. (US 5,180,440) discloses a printed circuit comprising a thermocouple junction (9) passing through an opening on a substrate (1).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaritza Guadalupe whose telephone number is (703)305 -5676. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F.F. Gutierrez can be reached on (703) 308-3875. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.



Y. Guadalupe
February 8, 2001

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